NAVFAC

Naval Facilities Engineering Command

Engineering Service Center

(MDI)

An Operational Risk Metric for Accessing the Criticality of Naval Shore Facilities

Port Hueneme, CA 93043

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

MDI is an Operational Risk Metric that describes the relative importance of Naval shore infrastructure in terms of mission criticality *(Developed by NAVFAC & USCG).*

ORM:

Make risk decisions at the right level

"Rely on the prudence, experience, judgement, intuition and situational awareness of leaders directly involved ".

MDI can be used for multiple purposes:

• Prioritization of shore facility Sustainment, Restoration and Modernization (SRM)

• Identify and evaluate physical security and Vulnerability issues from a mission perspective

NAVFAC — Naval Facilities Engineering Command
Engineering Service Center

If: There is not enough SRM dollars to fix everything that is broken;

Then: How do we judge the value of one against another?

Priorities ?

1 - ?
2 - ?
3 - ?
4 - ?
5 - ?
6 - ?
7 - ?
8 - ?
9 - ?

Operators

Air Ops
Communications
Port Ops
Training
Shipyard
RDT&E
POL Supply
Ammo Supply
Medical
Utilities

S&R

**Navy Requirements
CNI Requirements
Region's Requirements
Commanding Officer's Requirements**

3

NAVFAC
Naval Facilities Engineering Command
**Engineering Service Center**
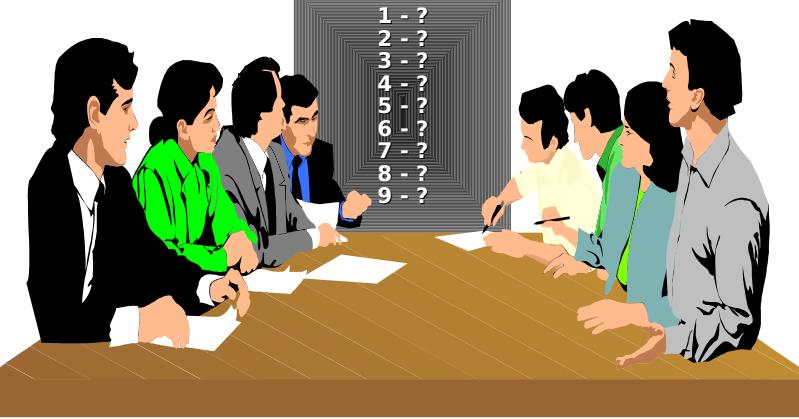
If: There is not enough ATFP dollars to protect all naval shore infrastructure;

**Then:** How do we judge the value one project against another?

Priorities ?

1 - ?
2 - ?
3 - ?
4 - ?
5 - ?
6 - ?
7 - ?
8 - ?
9 - ?

Operators

Air Ops
Communications
Port Ops
Training
Shipyard
RDT&E
POL Supply
Ammo Supply
Medical
Utilities
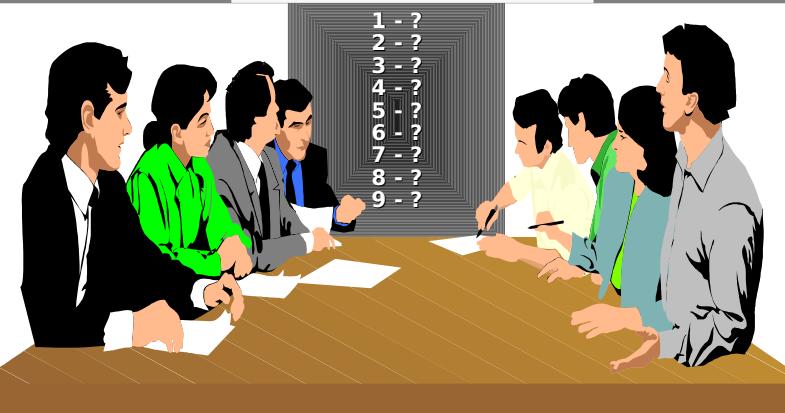
ATFP

**Navy Requirements
CNI Requirements
Region's Requirements
Commanding Officer's Requirements**

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

If the following facilities are destroyed or non-fu[...] Then what is the impact or consequences?

Critical

Relevant

Significant

Moderate

Low

Mission Dependency Index

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center
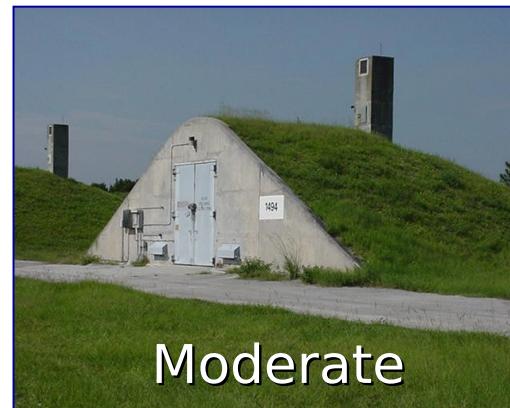
Ability to Relocate or Replace

Impossible
Difficult
Possible

Risk Severity

Year   Month   Week   Day   Min.   Sec.
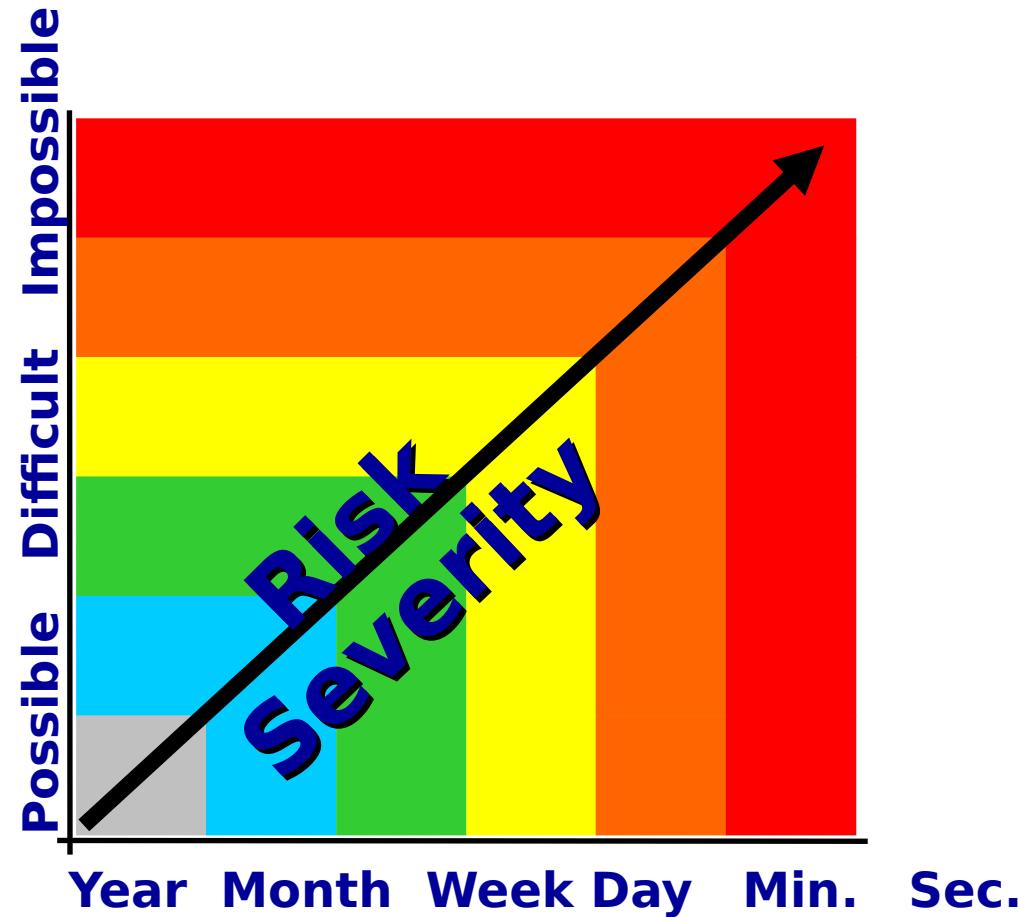
Interruptability of Function/Service

Within the Mission or Service Provided

Air Ops

Working closely with the **operational manager** Identif[y] all facilities and infrastructu[re] controlled or occupied by the "mission".

Mission : Air Operations

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

MDw -- Intra Dependency (within Mission)
infrastructure controlled or occupied by the

Q1: How long could the "functions" supported by your infrastructure be stopped without adverse impact to your mission?

(N) Must be maintained continuously: (24/7)
(B) Brief: Hours
(S) Short: Days or Weeks not to exceed 7 days
(P) Prolonged: > 7 days

Q2: If the facility were not functional, could you continue performing your mission by using another facility, or by setting up temporary facilities?

(I) No, It's impossible
(X) Yes, but with an extreme difficulty
(D) Yes, but with some difficulty
(P) Yes, with little or no difficulty

8

**Question 2: How difficult would it be to relocate to another location impacting mission readiness?**

- **Impossible** (**T**here are no viable commercial alternatives – only this bb
  site/command can provide these services),

- **Extremely Difficult** (**T**here are viable commercial alternatives, but no
  readily available contract mechanism in place to replace the services),

- **Difficult** (services exist and are available, but the form of delivery is ill
  defined or will require a measurable and unbudgeted level of effort to
  obtain (money/man-hours), but mission readiness capabilities would
  not be compromised in the process),

- **Possible** (services exist, are available, and are well defined).

Mission Dependency Index

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

MD_W

	Q1: Interruptability of Function			
	None	**Briefly**	**Short**	**Prolonged**
	Available 24hrs/7 days	$\leq$ 24 hrs	1 to 7 days	> 7 days
Impossible	6.00	5.50	4.67	3.67
X Difficult	5.10	4.43	3.43	2.60
Difficult	4.90	4.23	3.23	2.40
Possible	4.00	3.00	2.00	1.00

Q2: Relocateability

Between Missions or Services

Highways

Air Ops

Fuel

Weapons

Port Ops

Bridges
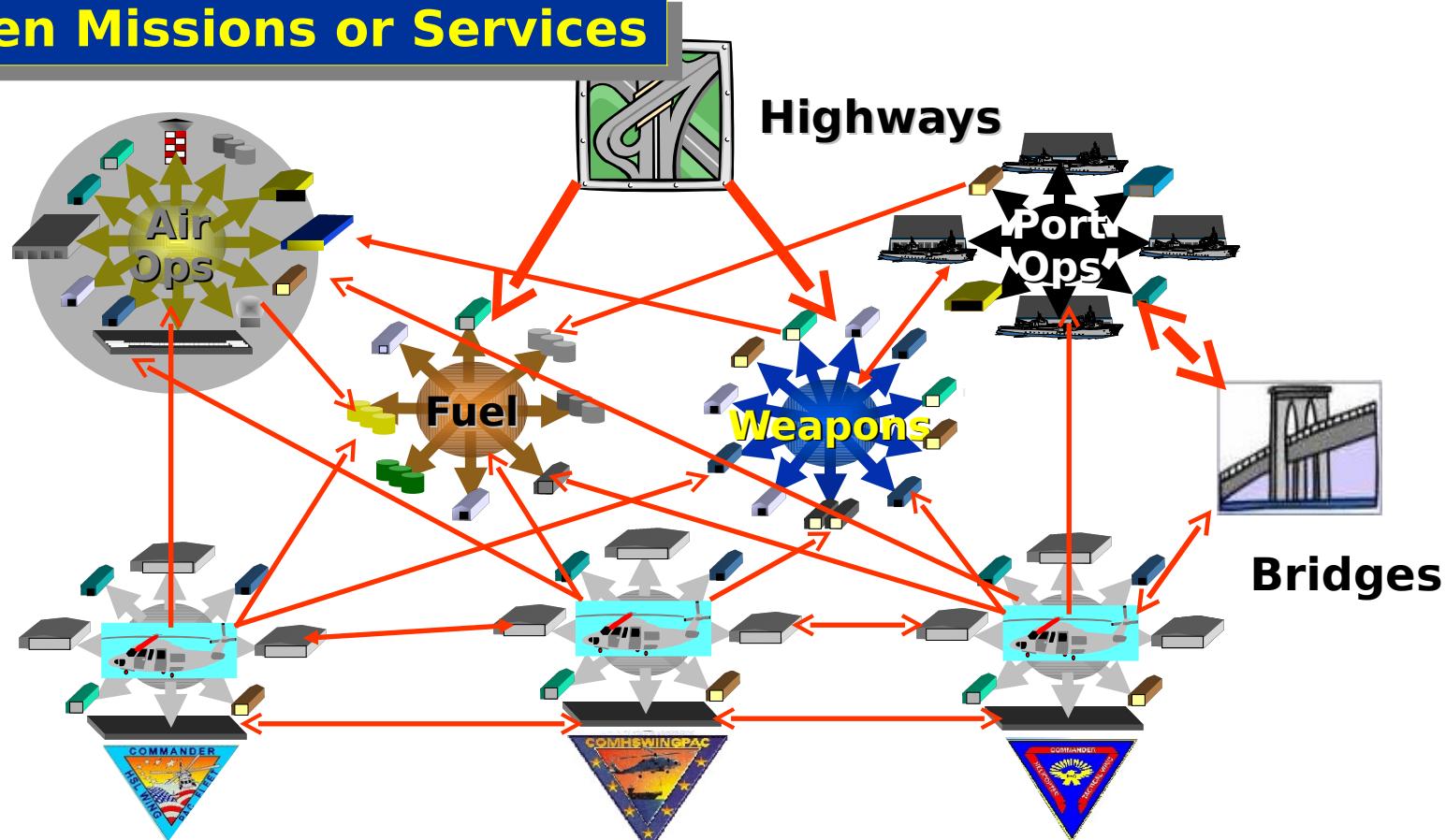
Ask the operator to identify support missions or services that make possible for his/her organization to accomplish it's mission.

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

MDb -- Interdependency (between Mission)
infrastructure NOT controlled or occupied by the activity

Q3: How long could the services provided by (*named organization*) be interrupted before impacting your mission readiness.?

(B) Brief: Hours

(S) Short: Days or Weeks not to exceed 2 weeks

(P) Prolonged: Weeks or Months

Q4: How difficult would it be to replace or replicate the services provided
By (*name organization*) with another provider or source?

(I) No, It's impossible

(X) Yes, but with extreme difficulty

(D) Yes, but with some difficulty

(P) Yes, with little or no difficulty

Mission Dependency Index

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

Question 4: How difficult would it be to replace or replicate the services provided by with another provider from any source?

- **Impossible** *(there are no known redundancies or excess/surge*
  capacities available, or there are no viable commercial alternatives –
  only this site/command can provide these services),

- **Extremely Difficult** *(there are minimally acceptable redundancies or*
  excess/surge capacities available, or there are viable commercial
  alternatives, but no readily available contract mechanism in place to
  replace the services),

- **Difficult** *(services exist and are available, but the form of delivery is ill*
  defined or will require a measurable and unbudgeted level of effort to
  obtain (money/man-hours), but mission readiness

Mission Dependency Index

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

MD_b

		Q1: Interruptability of Function			
		None	**Briefly**	**Short**	**Prolonged**
		Available 24hrs/7 days	≤ 24 hrs	1 to 7 days	> 7 days
Q2: Relocateability	**Impossible**	**6.00**	**5.50**	**4.67**	**3.67**
	X Difficult	**5.10**	**4.43**	**3.43**	**2.60**
	Difficult	**4.90**	**4.23**	**3.23**	**2.40**
	Possible	**4.00**	**3.00**	**2.00**	**1.00**

14

Roll-up: (MD*w*), (MD*b* ave.), n

BLDG. 793

Facility No.	Facility Name	Q1/Q2 MDw	MDb avg	n
0793	Air Traffic Control Bldg.	5.10	5.43	5

Other Missions	Q3/Q4 MDb
COMHSWING	6.00
COMHSLWINGPAC	6.00
COMHELTACWINGPAC	6.00
FEDERAL FIRE	4.90
SUPPLY/FUEL	4.23
MDb total	27.13
MDb ave	5.43
(No. of Missions) n	5

MDI   Mission Dependency Index: $1 \leq MDI \leq 100$

**MD**$_w$ Mission **Intra**dependency (**Within** Mission); $1 \leq MD_w \leq 6$

MD$_b$ Mission **Inter**dependency (**Between** Missions) $1 \leq MD_b \leq 6$

n   Number of Mission Interdependencies

$$MDI = \{16.5 [MD_w + MD_{b\ avg} + .025\ Ln(N)] - 15.5\ ...\} / 8$$

85.7% MDw
10.7% MDb
3.6%   n

Engineering Service Center
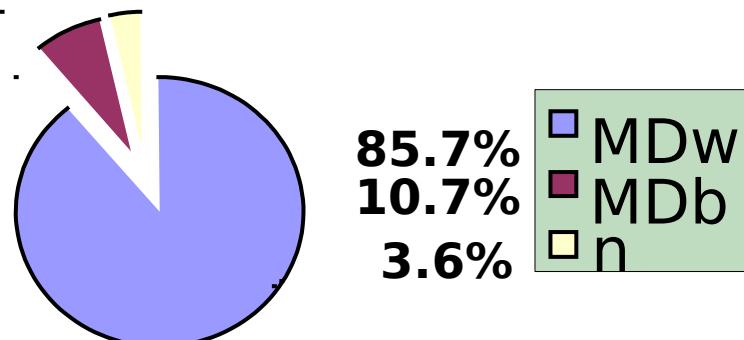
$$MDI = \{16.5\ [5.10 + \underline{5.48} + .025x\ x] - 1\ 8$$

Air Ops Control Tower (Bldg. 793)
MDI = 81 **"Significant"**

100	
Critical	
85	
Significant	
70	
Relevant	
55	
Moderate	
40	
Low	
0	

NAVFAC — Naval Facilities Engineering Command
Engineering Service Center
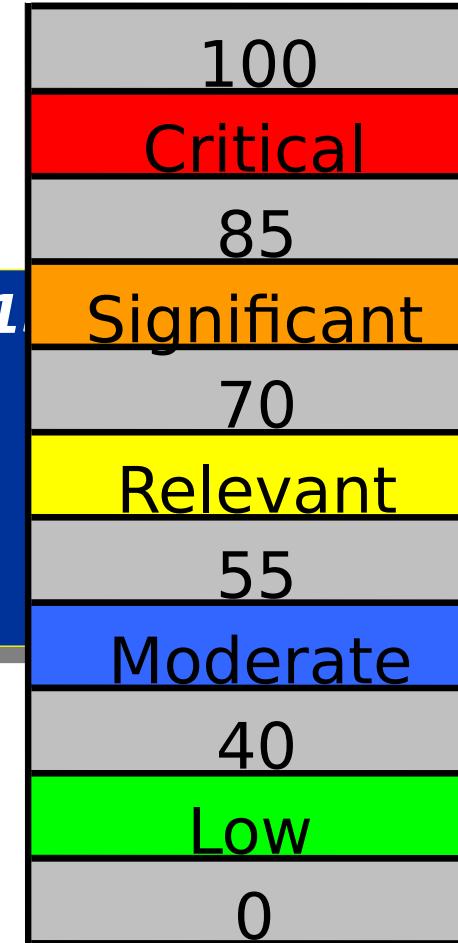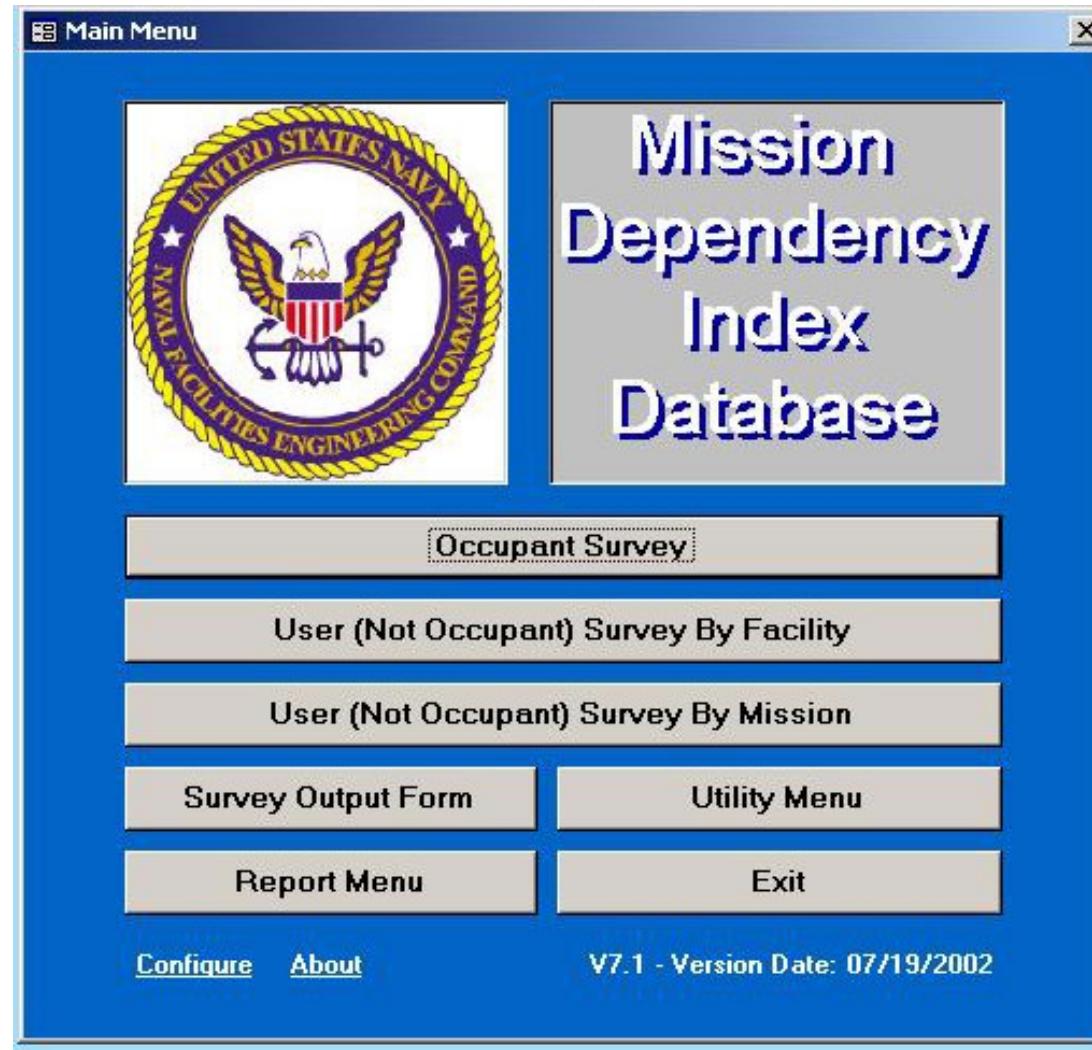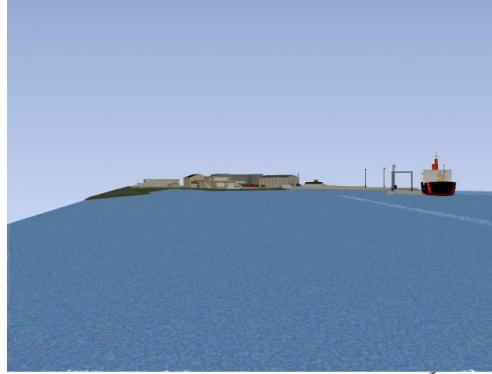
Base Level

Building Level
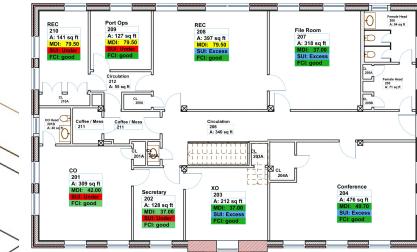
ARMY RESERVE
MDI: 56.90

BARRACKS BLDG
MDI: 53.00
SUI: Excess

3 BAY STORAGE
MDI: 43.40

IND BLDG
MDI: 65.50
SUI: Meet

RICE BLDG
MDI: 95.00
SUI: Meet

MSQ BLDG
MDI: 73.00
SUI: Under

HAZMAT
MDI: 74.30

PAINT BOOTH
MDI: 78.50

GENERATOR
MDI: 94.80

MAIN BLDG
MDI: 94.80

BASE CHARLESTON MDI

Regional Lev

USCG Base Charleston, SC

ISC Seattle

Group Woods Hole

Wallops Is.

ISC Alameda

NWC Seal Beach

ISC Charleston

Fort Bragg

Pearl Harbor

NASNI

SUBASE Kings Bay

San Clemente Is.

NAVSTA Mayport
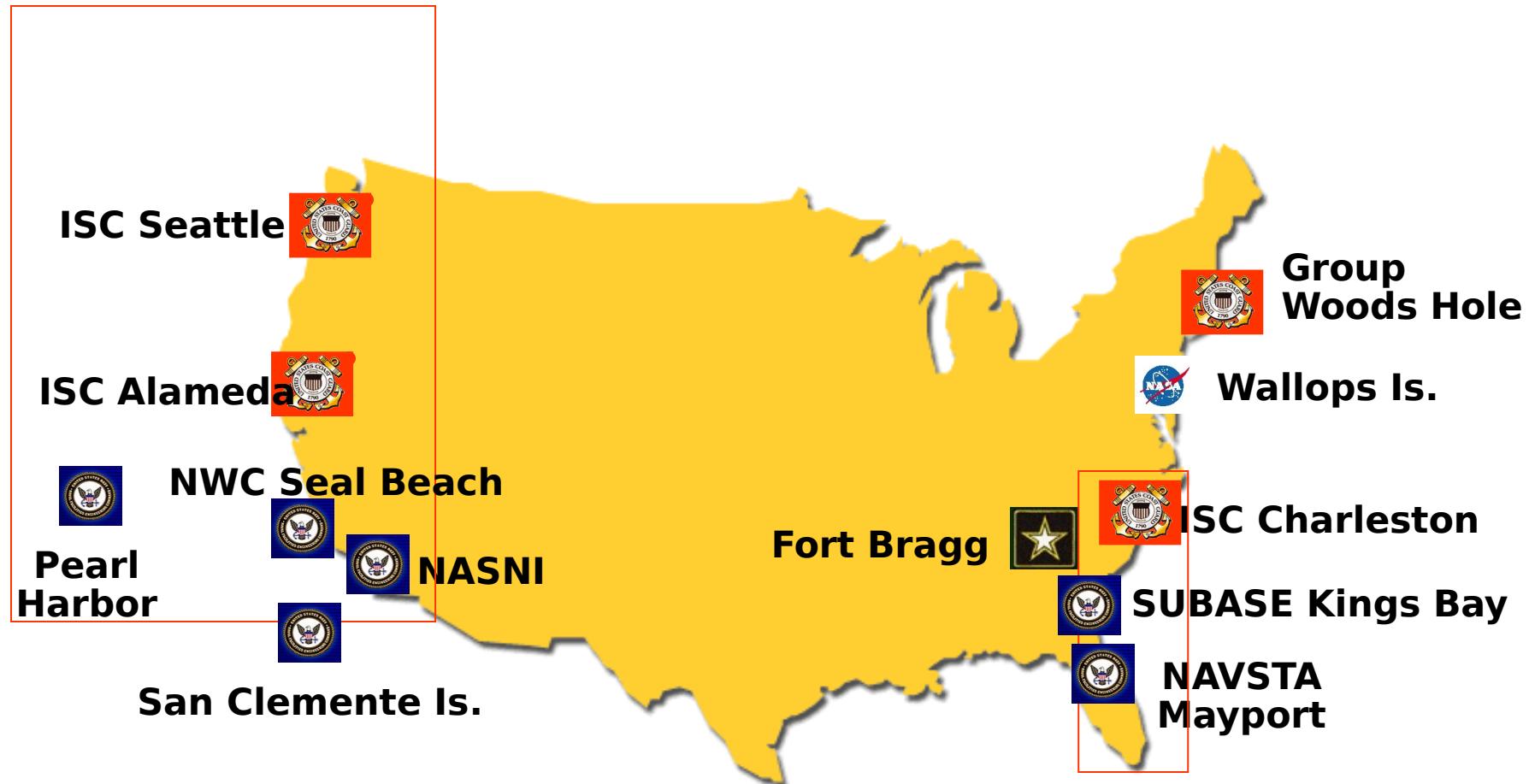
MDI was jointly developed, tested and validated by NAVF

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

- **Makes SR&M and Physical Security decision-making more;**
  - **Objective**
  - **Consistent**
  - **Auditable**
  - **Dynamic (*will reflect change in force structure*)**

- **Coordinates operational, logistical, and financial decision-making**
  - **Can quickly generate a "strawman" program based primarily on mission criticality *(Most bang for the buck).***

- **Easy to use and understand**
  - **Can be used to visualize information (GIS)**
  - **Scalable 2D, 3D, and 4D models**

- **Physical Security & Force Protection**
  - **Can be used with other Physical Security and Force Protection metrics.**

Mission Dependency Index